

## SYSTEMS AND METHODS OF PRODUCING HYDROGEN USING A NUCLEAR REACTOR

## ABSTRACT OF THE DISCLOSURE

A system for generating hydrogen includes a liquid metal nuclear reactor having a non-radioactive secondary heat loop, a steam generator connected to the secondary heat loop, a high temperature water cracking system, and a topping heater. The heat produced by the nuclear reactor is used to raise the temperature of the feed water for the cracking system to between about 450°C to about 550°C. The topping heater raises the feed water temperature from the 450°C to 550°C range to at least 850°C so that the cracking system can operate efficiently to produce hydrogen and oxygen.